

8. Report on Deaths which occurred in the Zoological Gardens during 1920. By N. S. LUCAS, M.B., F.Z.S., Pathologist to the Society.

[Received January 31, 1921: Read February 22, 1921.]

On Jan. 1st, 1920, there were living in the Gardens :—

586 mammals,	1333 birds,	411 reptiles.
(826)	(2162)	(486)

To these were added during the year :—

450 mammals,	1138 birds,	693 reptiles.
(446)	(1356)	(683)

Giving a total of :—

1036 mammals,	2471 birds,	1104 reptiles.
(1272)	(3518)	(1169)

The total of deaths which took place during the year 1920 was 1101. This was made up as follows :—

333 mammals,	490 birds,	262 reptiles.
(356)	(857)	(467)

This gives a percentage of deaths to animals living in the Gardens during the year of :—

32·1	19·8	20·1.
(27·9)	(24·3)	(39·4)

If only those animals which had lived in the Gardens for six months or more are considered (it being assumed that these are acclimatized), the number of deaths is as follows :—

167 mammals,	230 birds,	50 reptiles.
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Giving a percentage of deaths of :—

16·1	9·3	4·5.
(16·9)	(16·4)	(13·8)

As this is the first year in which the numbers have come up to pre-war standards, or nearly so, the figures for 1913 are given in brackets corresponding to each of the above.

Comparing these figures, those for mammals remain very constant. The increase in 4·2 per cent. of the death-rate may be considered as due to the higher ratio of unacclimatized mammals. If only the acclimatized are taken, there is a drop of 0·8 per cent.

The total number of birds in the Gardens shows a drop of approximately 1100. The bird population in 1913 was nearly 50 per cent. greater than now. The total and acclimatized death-rate has diminished. In the latter case this is very marked. A reference to the diminished figures for avian tuberculosis and

mycosis will shed some light on this fall. How much of this diminution in the incidence of these diseases is due to the birds being less crowded it is difficult to say. If the numbers of birds rise to pre-war height, it will be interesting to watch the corresponding effect on these diseases.

The decrease in the death-rate among the reptiles is still more marked, being nearly half, even when newly-imported individuals are considered. This is due to the absence of an epidemic of pneumonia, which in 1913 claimed 138 victims, while the total deaths from lung diseases for 1920 is 61.

If only the more acclimatized specimens are considered, the death-rate is remarkably low. This is probably due to the fact that those which had been in the Gardens for more than six months were mostly reptiles which had survived the difficult period of the war and were rather specially well acclimatized.

Notes on the Analysis of the Causes of Death.

1. *Pleurisy*.—It is interesting to note the rarity of this disease among animals in comparison with its common incidence among humans.

One case occurred in a green cercopitheque, the other in a macaque.

2. This occurred in a grey mongoose.

3. This was found in an Indian hunting dog, and was due to a nematode, *Spiroptera sanguinolenta*.

4. This occurred in a Burnett's cercopitheque.

5. It is difficult to account for the diminution in the deaths from nephritis. The figures this year are 8, 31, and 0 for the three classes, while in 1913 they were 90, 135, and 6. At first sight it might seem that this was due to a difference in opinion as to the cause of death, but as there has been no corresponding rise in any other disease or diseases, this cannot be the cause. So little is known as to the cause of nephritis, that it is impossible to assign a reason.

6. In a budgerigar.

7. Enteritis still remains the chief cause of death among the birds. One organism, that of *B. aertryck*, has been isolated from a newly-imported grey touracou and a newly-imported parakeet.

8. These occurred in a ring-tailed lemur, a badger, and a bonnet macaque.

9. In a black-backed jackal.

10. In a bonnet macaque. This was an old individual.

11. In a fairy blue-bird.

12. In a violet tanager.

13. The high death-rate from tuberculosis among the mammals as compared with that of birds is of interest.

Among the mammals 69 deaths occurred, of which 43 were those of macaques in the canal-bank aviary. Of the remaining 26, five occurred in the Lion House, leaving 21 for the other

Analysis of Causes of Death.

Disease.		Mammals.	Birds.	Reptiles, etc.
<i>Diseases of Respiratory Organs.</i>	Lobar pneumonia	14	...	...
	Broncho-pneumonia	35	41	10
	Congestion of lungs	29	30	23
	Bronchitis	29	62	28
	Edema of lungs .....	...	5	...
	(1) Pleurisy	1	...	...
	Pleurisy with effusion	1	...	...
	Abscess of lung	1	...	...
	(2) Paragonimiasis of lung	1	...	...
	Collapse of lung (rickets)	4	...	...
<i>Diseases of Cardiovascular System.</i>	Granuloma of lung	1	...	...
	Pleurisy and pericarditis	1	...	...
	Pericarditis	1	9	1
	Endocarditis	1	...	...
	(3) Ruptured aneurism	1	...	...
	Ruptured heart .....	...	1	...
	Ruptured artery	3	2	...
	Anaemia .....	...	...	1
	(4) Anaemia of spleno-me- dullary type	1	...	...
	<i>Diseases of Genito-urinary System.</i>	(5) Nephritis	8	31
(6) Cystic kidney .....		...	1	...
Necrosis of kidney .....		...	1	...
Egg-binding .....		...	4	...
Inflammation of oviduct .....		...	3	...
Carcinoma of testicle .....		...	1	...
Stomatitis .....		...	...	2
<i>Diseases of alimentary tract.</i>	(Esophageal abscess .....	...	1	...
	Gastritis	4	...	6
	(7) Enteritis	34	124	24
	(8) Intussusception	3	...	...
	(9) Intestinal obstruction } ? old intussusception }	1	...	...
	(10) Volvulus	1	...	...
	Granuloma of intestines	1	1	...
	(11) Ulceration of cloaca .....	...	1	...
	(12) Fibroma of cloaca .....	...	1	...
	Peritonitis	5	...	...
	Granuloma of mesentery	1	...	...
	Fatty degeneration of liver .....	...	10	1
<i>Diseases of Liver.</i>	Cirrhosis of liver	2	3	...
	Portal pyaemia	1	...	...
	Ruptured liver .....	...	1	...
	<i>Diseases of Pancreas.</i>	Pancreatitis	2	...
<i>Diseases of Nervous System.</i>		(Edema of brain	1	...
	<i>Diseases due to Infection.</i>	(13) Tuberculosis	69	7	2
(13a) Mycosis		2	21	1
Anthrax		1	...	...
Toxaemia		8	2	...
Helminthiasis		2	5	7
<i>Various</i>		Sarcoma	2
	Abscess of ribs .....	...	1	...
	Ascites ? cause .....	...	1	...
	Debility	7	...	...
	Inanition .....	...	...	42
	Senility .....	...	1	...
	Under anaesthetic	1	...	...
	Exposure	8	...	...
	Killed by accident or by order	22	44	3
	Eaten by rats	2	11	8
	Decomposed	7	19	44
	Not diagnosed	7	23	22
	Not examined	9	2	16

houses and enclosures. In 1913 there were 31 deaths of this disease, of which 15 came from an epidemic in what is now called the Rodent House, so that, deducting the epidemics, there is a slight rise in the death-rate from tubercle this year as compared with 1913.

Of the 26 cases occurring this year, seven only had been in the Gardens less than six months, and of two the date of arrival was accidentally omitted. Of the remaining 17, eleven had been in the Gardens over a year and a half. One, a blesbok, had been there nine years.

It is therefore difficult on these figures to give any opinion as to the method of the introduction of the disease to the Gardens.

The small death-rate among the birds may have the same origin as that of mycosis.

13*a*. Among the cases of mammalian tuberculosis was that of an axis deer with disease of the genital organs, which is extremely rare in the lower mammals. The animal had been in the Gardens for many years.